

PP-1

Effect Of Green Synthesized Silver Nanoparticles On Post Harvest Shelf Life Of Horticultural Crops

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Production of various horticultural crops acts as a good source of income for a large number of producers in most of the developing countries around the world. But, extensive postharvest losses make their production unprofitable. Various pre-harvest and postharvest handling practices are performed nowadays to combat this bottleneck. In our study, we examined a novel postharvest treatment where we performed green synthesis of silver nanoparticles from leaf extract of *Azadirachta indica* (neem) and sprayed it on different horticultural crops like *Citrus reticulata*, *Musa acuminata* and *Solanum lycopersicum* in variable concentrations and checked its efficiency on postharvest shelf life. Absorbance peak in UV visible spectrophotometer within the range of 386-410nm at different concentration of the extract confirmed the formation of silver nanoparticles. After four days of spraying of the silver nanoparticle extract, the crops started showing noticeable physical changes. The control samples of banana started to rot on day 4 , on day 7 orange and tomato control started to rot. And only neem extracted started to rot on orange(11th day), tomato(25th day) and banana(22nd day) whereas the samples treated with silver nanoparticle extract remained healthy without any fungal attack till one month. Further we went for the isolation and identification of the fungus from the diseased crops by culturing the diseased samples on potato dextrose agar plates. The pure cultures obtained were identified morphologically. Putatively identified predominant fungus isolated from Orange was *Penicillium digitatum*, Tomato was *Mucor sp* and banana was *Fusarium sp*. Spores of all three fungus were evaluated by using haemocytometer After calculation we got *Penicillium digitatum*(4.2×10^5 spores/ml),*Mucor sp*(3.44×10^5 spore/ml) and *Fusarium sp*(2.92×10^5 spores/ml).Thus, from our investigation we can conclude that green synthesised silver nanoparticle acted as a very strong alternative postharvest handling practice, since it protected various horticultural crops from spoilage or fungal attack for extended period. Therefore, the efficacy of green synthesized nanofomulation compatible with the consumer will provide a platform for the maintenance of perishable horticultural crops in future.

Keywords: Green synthesis, Silver nanoparticles, *Azadirachta indica*, Post-harvest, Shelf life, Horticultural crops.